

GUS-0110 ✓  
Copy 1 of 6

29 January 1959

MEMORANDUM FOR : Deputy Director (Plans)  
THROUGH : Director of Development and Procurement, DPD (P)  
SUBJECT : Reconnaissance Guidelines for GUSTO

1. The purpose of this paper is to bring to your attention the guidelines being used to design reconnaissance equipments for GUSTO. Your comments will be appreciated.

2. The following postulations were used to derive the guidelines:

A. The authorization for long range penetrations (LRP) missions will be as difficult to obtain as they have in the past.

B. The maximum intelligence information must be obtained during every LRP mission.

3. Keeping the above two major points in mind, it is apparent the following should be used in the design of reconnaissance equipments:

A. Only passive equipments should be used. This would eliminate line scan (LSR) or PPI radar because of its susceptibility to detection.

B. Considering a system using only passive equipments there are two approaches to design:

1. Use a combination of visual photography and other sensors. Generally, this system is most applicable if we cannot choose mission time or intelligence requirements dictate specialized information. The use of other sensors with camera packages will necessarily decrease the weight and cubage available to the camera configurations. For example, 500# is allocated to reconnaissance sensors. Of this, ELINT will take approximately 100#. NOTE: It is planned ELINT will always be used regardless of the system to be used, i.e., all visual or combination sensors.) [REDACTED] similar system

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approximately 250#. This leaves a balance of approximately 150# for cameras. With this reduced weight and space we would be limited to the types of cameras we could utilize. For example, format size would be small (70MM), focal length would be short not exceeding 24" (focal length could probably be obtained, however, design of optical system would be more complex).

2. The second alternative is to depend on visual photography as our sole source of collection. Considering the duration of a mission (2 1/2 to 3 hours) and the consequent need to select our times of penetration we can design two major types of camera packages. For launching under maximum target illuminance conditions we can use a system capable of high resolution by using finer grained emulsions and slower exposure times. For missions performed under more adverse conditions a second system would be utilized. This camera system would use coarser grained (faster) emulsions, possibly with greater sensitivity in [REDACTED] optical systems with greater light gathering qualities. This second alternative has the following advantages:

- (a) It gives more intelligence information per unit package.

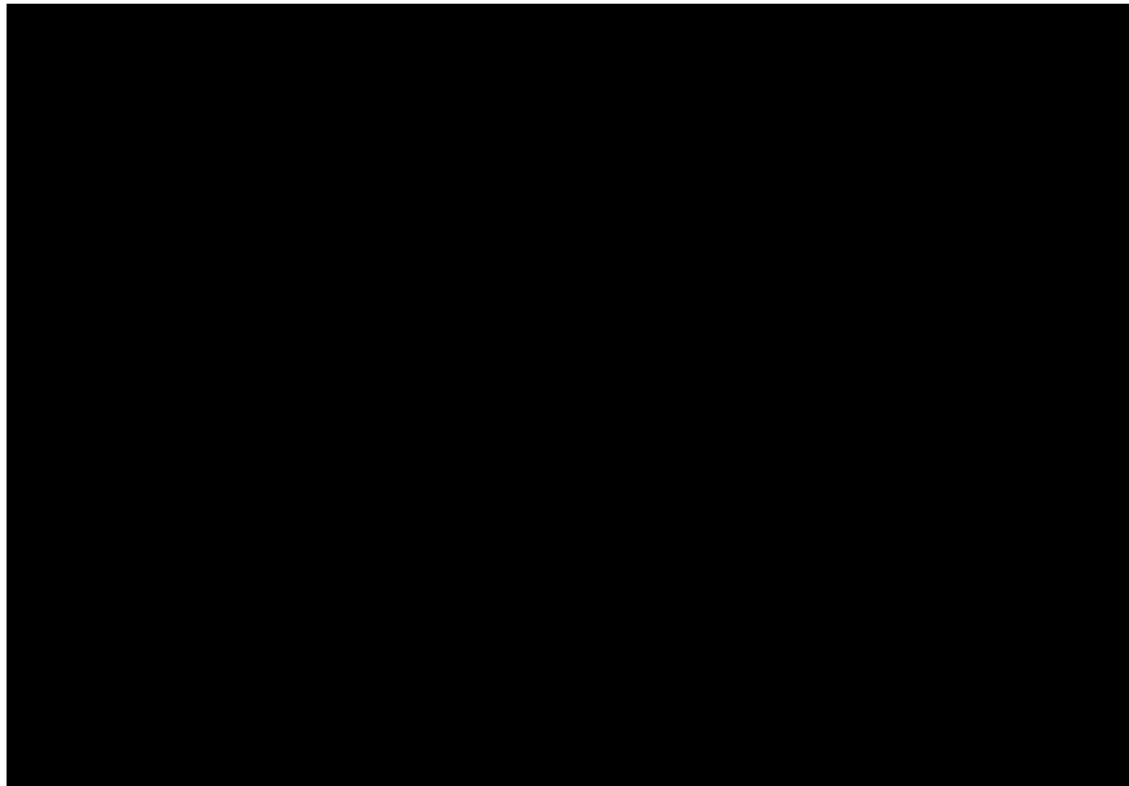
(b)

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For example, we could use faster optics, greater focal length, larger film formats and generally simplified camera design.

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C. Telemetry - Because of the characteristics of the vehicle (i.e. short time on station) this package which would be similar to our System 7 may have limited use and probably could not be incorporated into our combined configuration concept. The lightest weight quoted for this system (state of art 2 years from now is used) is 125#. I believe this weight is overly optimistic. Studies may indicate present U-2 could better perform this work on peripheral operations.

D. Visual Photography - Approach to design of a camera system will depend on our selection of Alternate 1 (par.3Ba) or Alternate 2 (par.3Bb); however, in any event we will request designers conform to the following major requirements:

- a. High acuity optics and maximum focal length consistent with space and weight allocation.
- b. Maximum photo coverage, not necessarily horizon to horizon.
- c. Format no smaller than 70 MM preferably 5" to 9 1/2" width.

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- d. Ability to take stereo photography. Use either convergent principle or wide angle lenses.
- e. Must use some type of thin base film.
- f. Photography must be compatible with present or planned exploitation equipment.

5. The above parameters are just a few of the items covered when representatives of [REDACTED] were briefed. The briefing included all information known to 7 January 1959. This included information from vehicle manufacturer and PIC. The undersigned favors Alternate 2, (ELINT and selected photo configurations); however, during the briefings I did not express my personal feelings as to systems. The representatives were given all information to design for either Alternate 2 or Alternate 1 (Elint and combined sensors).

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6. As a closing remark it is suggested camera designers and vehicle manufacturers be given an early opportunity to discuss their mutual problems and to assist each other in solving these problems or at least to be cognizant of the needs of the other.

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